

## CLAIMS

## WHAT IS CLAIMED IS:

1. An inline filter assembly comprising:
  - an elongate flexible inlet connecting tube having a proximal end and a distal end and a side wall defining a longitudinal flow passage therebetween;
  - an elongate flexible outlet connecting tube having a proximal end and a distal end and a side wall defining a longitudinal flow passage therebetween;
  - an intermediate filter body including an elongate hollow tube having a side wall defining a flow passage along a longitudinal axis with an inlet and an outlet at respective upstream and downstream ends spaced along said longitudinal axis;
  - a first fitting for connecting said inlet tube proximal end to said filter body at its upstream end, said first fitting having a relatively small diameter upstream distal end portion and a relatively large diameter downstream proximal end portion, said filter body inlet being positioned over said first fitting proximal end portion and having an internal diameter generally corresponding thereto, said inlet tube proximal end being positioned over said first fitting distal portion and having an internal diameter generally corresponding thereto, said first fitting defining a passageway therethrough extending between its distal and proximal portions to provide fluid communication between said inlet tube and said filter body;

a second fitting for connecting said outlet tube  
28 proximal end to said filter body at its downstream end,  
said second fitting having a relatively large diameter  
30 upstream proximal end portion and a relatively small  
diameter downstream distal end portion, said filter body  
32 outlet being positioned over said second fitting proximal  
end portion and having an internal diameter generally  
34 corresponding thereto, said outlet tube proximal end being  
positioned over said second fitting distal portion and  
36 having an internal diameter generally corresponding  
thereto, said second fitting defining a passageway  
38 therethrough extending between its proximal and distal  
portions to provide fluid communication between said filter  
40 body and said outlet tube; and,  
filter media disposed within said filter body for  
42 removing impurities from fluid flowing therethrough.

2. The inline filter of claim 1 wherein the  
2 internal diameter of the passageway of at least one of said  
fittings is relatively larger near its proximal end than at  
4 its distal end.

3. The inline filter of claim 2 further  
2 including second filter media disposed in one of said  
fittings within its passageway larger diameter portion for  
4 removing impurities from fluid flowing therethrough.

4. The inline filter of claim 1 further  
2 including second filter media disposed in the passageway of  
one of said fittings.

5. The inline filter of claim 4 wherein one of  
2 said filters physically removes solid impurities from fluid  
flowing therethrough.

6. The inline filter of claim 4 wherein one of  
2 said filters chemically purifies fluid flowing  
therethrough.

7. The inline filter of claim 4 wherein said  
2 first filter media is pervious to fluid flow and impervious  
to impurities larger than a first determined size to  
4 prevent larger impurities from moving from said inlet tube  
downstream to said outlet tube, and said second filter  
6 media is positioned downstream of said first filter media  
and is impervious to impurities larger than a second  
8 determined size smaller than said first predetermined size  
to prevent smaller impurities from moving from said inlet  
10 tube downstream to said outlet tube.

2 8. The inline filter of claim 4 wherein said  
first filter media is an array of filtering particles.

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9. The inline filter of claim 8 further  
6 including a fluid pervious barrier filter positioned  
between said array of filtering particles and one of said  
8 fittings for maintaining said filtering particles within  
said filter body.

10. The inline filter of claim 4 wherein said  
2 second filter media is sintered bronze.

11. The inline filter of claim 4 wherein one of  
2 said filter media is a longitudinal series of at least two  
filter elements for removing impurities from fluid flowing  
4 therethrough, each filter element having a differing  
porosity with a downstream filter element being impervious  
6 to smaller impurities than an upstream filter element.

12. The inline filter of claim 11 wherein said  
2 series of filters is a longitudinal series of particulate  
layers, each layer having particulate of a size relatively  
4 different from the particulate of an adjacent layer whereby  
each layer is impervious to different sized impurities.

13. The inline filter of claim 11 wherein said  
2 series of filters is a longitudinal series of screens, each  
screen having a different size mesh whereby each screen is  
4 impervious to different sized impurities.

14. The inline filter of claim 1 further  
2 including second filter media disposed between said first  
fitting and said first filter media for removing impurities  
4 from fluid flowing therethrough.

15. An inline filter assembly comprising:

2           an elongate flexible inlet connecting tube having  
a proximal end and a distal end and a side wall defining a  
4 longitudinal flow passage therebetween;

          an elongate flexible outlet connecting tube  
6 having a proximal end and a distal end and a side wall  
defining a longitudinal flow passage therebetween;

8           an intermediate filter body including an elongate  
hollow tube having a side wall defining a flow passage  
10 along a longitudinal axis with an inlet and an outlet at  
respective upstream and downstream ends spaced along said  
12 longitudinal axis;

          a first fitting for connecting said inlet tube  
14 proximal end to said filter body at its upstream end, said  
first fitting having a relatively small diameter upstream  
16 distal end portion and a relatively large diameter  
downstream proximal end portion, said filter body inlet  
18 being positioned over said first fitting proximal end  
portion and having an internal diameter generally  
20 corresponding thereto, said inlet tube proximal end being  
positioned over said first fitting distal portion and  
22 having an internal diameter generally corresponding  
thereto, said first fitting defining a passageway  
24 therethrough extending between its distal and proximal  
portions to provide fluid communication between said inlet  
26 tube and said filter body with the internal diameter of  
said passageway being relatively larger near its proximal  
28 end than at its distal end;

          a second fitting for connecting said outlet tube  
30 proximal end to said filter body at its downstream end,

said second fitting having a relatively large diameter  
32 upstream proximal end portion and a relatively small  
diameter downstream distal end portion, said filter body  
34 outlet being positioned over said second fitting proximal  
end portion and having an internal diameter generally  
36 corresponding thereto, said outlet tube proximal end being  
positioned over said second fitting distal portion and  
38 having an internal diameter generally corresponding  
thereto, said second fitting defining a passageway  
40 therethrough extending between its proximal and distal  
portions to provide fluid communication between said filter  
42 body and said outlet tube with the internal diameter of  
said passageway being relatively larger near its proximal  
44 end than at its distal end; and,  
filter media disposed within said filter body for  
46 removing impurities from fluid flowing therethrough.

16. The inline filter of claim 15 further  
2 including an external rib extending radially outward from  
each of said fitting distal end portions for limiting  
4 relative longitudinal movement of said connecting tubes  
over the external surface of said fittings, each of said  
6 external ribs having a camming surface facing the distal  
end of said fittings, and said connecting tubes being  
8 sufficiently resilient to facilitate longitudinal  
positioning of said connecting tubes onto the fitting  
10 distal end portions over said ribs.

17. The inline filter of claim 16 further  
2 including a pair of tube clamps, one of said clamps being  
circumferentially positioned over each of said connecting  
4 tubes near its respective proximal end to hold said  
connecting tubes on the distal end portions of said  
6 fittings.

18. The inline filter of claim 15 further  
2 including an external rib extending radially outward from  
each of said fitting proximal end portions for limiting  
4 relative longitudinal movement of said filter body over the  
external surface of said fittings.

19. The inline filter of claim 18 wherein each  
2 of said external ribs has a camming surface facing the  
proximal end of said fittings, said filter body being  
4 flexible and sufficiently resilient to facilitate  
longitudinal positioning of said filter body onto the  
6 fitting proximal end portions over said ribs.

20. The inline filter of claim 19 further  
2 including a pair of tube clamps, one of said clamps being  
circumferentially positioned over said filter body near  
4 each end thereof to hold said filter body on the proximal  
end portions of said fittings.

21. An inline filter assembly comprising:

2           an elongate flexible inlet connecting tube having  
a proximal end and a distal end and a side wall defining a  
4 longitudinal flow passage therebetween;

          an elongate flexible outlet connecting tube  
6 having a proximal end and a distal end and a side wall  
defining a longitudinal flow passage therebetween;

8           an intermediate filter body including an elongate  
flexible hollow tube having a side wall defining a flow  
10 passage along a longitudinal axis with an inlet and an  
outlet at respective upstream and downstream ends spaced  
12 along said longitudinal axis;

          a first fitting for connecting said inlet tube  
14 proximal end to said filter body at its upstream end, said  
first fitting having a relatively small diameter upstream  
16 distal end portion and a relatively large diameter  
downstream proximal end portion, said filter body inlet  
18 being positioned over said first fitting proximal end  
portion and having an internal diameter generally  
20 corresponding thereto, said inlet tube proximal end being  
positioned over said first fitting distal portion and  
22 having an internal diameter generally corresponding  
thereto, said first fitting defining a passageway  
24 therethrough extending between its distal and proximal  
portions to provide fluid communication between said outlet  
26 tube and said filter body with the internal diameter of  
said passageway being relatively larger near its proximal  
28 end than at its distal end;

          a second fitting for connecting said outlet tube  
30 proximal end to said filter body at its downstream end,



32 said second fitting having a relatively large diameter  
upstream proximal end portion and a relatively small  
diameter downstream distal end portion, said filter body  
34 outlet being positioned over said second fitting proximal  
end portion and having an internal diameter generally  
36 corresponding thereto, said outlet tube proximal end being  
positioned over said second fitting distal portion and  
38 having an internal diameter generally corresponding  
thereto, said second fitting defining a passageway  
40 therethrough extending between its proximal and distal  
portions to provide fluid communication between said filter  
42 body and said outlet tube with the internal diameter of  
said passageway being relatively larger near its proximal  
44 end than at its distal end;

an external rib extending radially outward from  
46 each of said fitting proximal end portions for limiting  
relative longitudinal movement of said filter body over the  
48 external surface of said fittings, each of said external  
ribs having a camming surface facing the proximal end of  
50 said fittings, said filter body being sufficiently  
resilient to facilitate longitudinal positioning of said  
52 filter body onto the fitting proximal end portions over the  
proximal end ribs;

54 a first pair of tube clamps, one clamp being  
circumferentially positioned over said filter body near  
56 each end thereof to hold said filter body on the distal end  
portions of said fittings;

58 an external rib extending radially outward from  
each of said fitting distal end portions for limiting  
60 relative longitudinal movement of said connecting tubes

over the external surface of said fittings, each of said  
62 external ribs having a camming surface facing the distal  
end of said fittings, said connecting tubes being  
64 sufficiently resilient to facilitate longitudinal  
positioning of said connecting tubes onto said fitting  
66 distal end portions over the distal end ribs;

a second pair of tube clamps, one of said second  
68 clamps being circumferentially positioned over each of said  
connecting tubes near its respective proximal end to hold  
70 said connecting tubes on the distal end portions of said  
fittings; and,

72 filter media disposed within said filter body for  
removing impurities from fluid flowing therethrough.

22. The inline filter of claim 21 further  
2 including second filter media disposed in one of said  
fittings within its passageway larger diameter portion for  
4 removing impurities from fluid flowing therethrough.